



## IEEE 802.11b/g/n Wireless Outdoor CPE

### Quick Installation Guide



V3.0.4 May 2011

---

## Copyright

Copyright © 2011 all rights reserved. No part of this publication may be reproduced, adapted, stored in a retrieval system, translated into any language, or transmitted in any form or by any means without the written permission of the supplier.

## About the Quick Installation Guide

This Quick Installation Guide is intended to guide professional installer to install the IEEE 802.11b/g/n Wireless CPE. It covers procedures to assist you in avoiding unforeseen problems.

## Conventions

 **Warning:**

---

This sign indicates a warning or caution that you have to abide.

---

 **Note:**

---

This sign indicates an important note that you must pay attention to.

---

---

# Chapter 1 Introduction

## Introduction

The IEEE 802.11b/g/n Wireless CPE is a multi-mode last-mile broadband solution for customers like wireless ISP (WISPs) and system integrators. By the nature of complying with the IEEE802.11n standard and featuring high power output, IEEE 802.11b/g/n Wireless CPE supports higher bandwidth with longer range for outdoor applications.

IEEE 802.11b/g/n Wireless CPE can be used as the access point, the customer premises equipment (CPE), the WDS or the AP Repeater. While being as the access point, it can be deployed outdoors to provide outdoor wireless internet service. In the other way to be as the outdoor CPE, it can receive wireless signal over the last mile, helping WISPs deliver internet service to the new residential and the business customer where wired broadband internet service, such as cable and DSL, can not serve in. In addition, the easy-to-install IEEE 802.11b/g/n Wireless CPE covers 2.4GHz bands, which features outstanding throughput performance and a cost-effective design that allows users to have the reliable outdoor equipment at the affordable price.



---

# **Chapter 2 Preparation before Installation**

This chapter describes safety precautions and product information you have to know. Please check this chapter before installing the IEEE 802.11b/g/n Wireless CPE.

## **Professional Installation Required**

Please seek assistance from a professional installer who is well trained in the RF installation and knowledgeable in the local regulations.

## **Safety Precautions**

To keep you safe and install the hardware properly, please read and follow these safety precautions.

1. If you are installing the IEEE 802.11b/g/n Wireless CPE for the first time, for your safety as well as others', please seek assistance from a professional installer who has received safety training on the hazards involved.
2. Keep safety as well as performance in mind when selecting your installation site, especially where there are electric power and phone lines.
3. When installing the IEEE 802.11b/g/n Wireless CPE, please note the following things:
  - ◆ Do not use a metal ladder;
  - ◆ Do not work on a wet or windy day;
  - ◆ Wear shoes with rubber soles and heels, rubber gloves, long sleeved shirt or jacket.
4. When the system is operational, avoid standing directly in front of it. Strong RF fields are present when the transmitter is on.

---

## Installation Precautions

To keep the IEEE 802.11b/g/n Wireless CPE well while you are installing it, please read and follow these installation precautions.

1. Users MUST use a proper and well-installed grounding and surge arrestor with the IEEE 802.11b/g/n Wireless CPE; otherwise, a random lightening could easily cause fatal damage to IEEE 802.11b/g/n Wireless CPE. **EMD (Lightning) DAMAGE IS NOT COVERED UNDER WARRANTY.**
2. Users MUST power the IEEE 802.11b/g/n Wireless CPE from an IEEE 802.3af switch or compatible injector. Use of non IEEE 802.3af compatible power source may cause damage to the IEEE 802.11b/g/n Wireless CPE .
3. Before powering on the IEEE 802.11b/g/n Wireless CPE, please verify that the external antenna is properly installed or damage may be caused to the unit.

*(APX-3100 Note: Though Internal Antenna is Selectable in the WEB Management, the APX-3100 only supports external antenna capabilities.)*

## Product Package

The product package you have received should contain the following items. If any of them are not included or damaged, please contact your local vendor for support

APX-3100	x1
User Manual CD	x1
Mounting kits	x1



### Note:

---

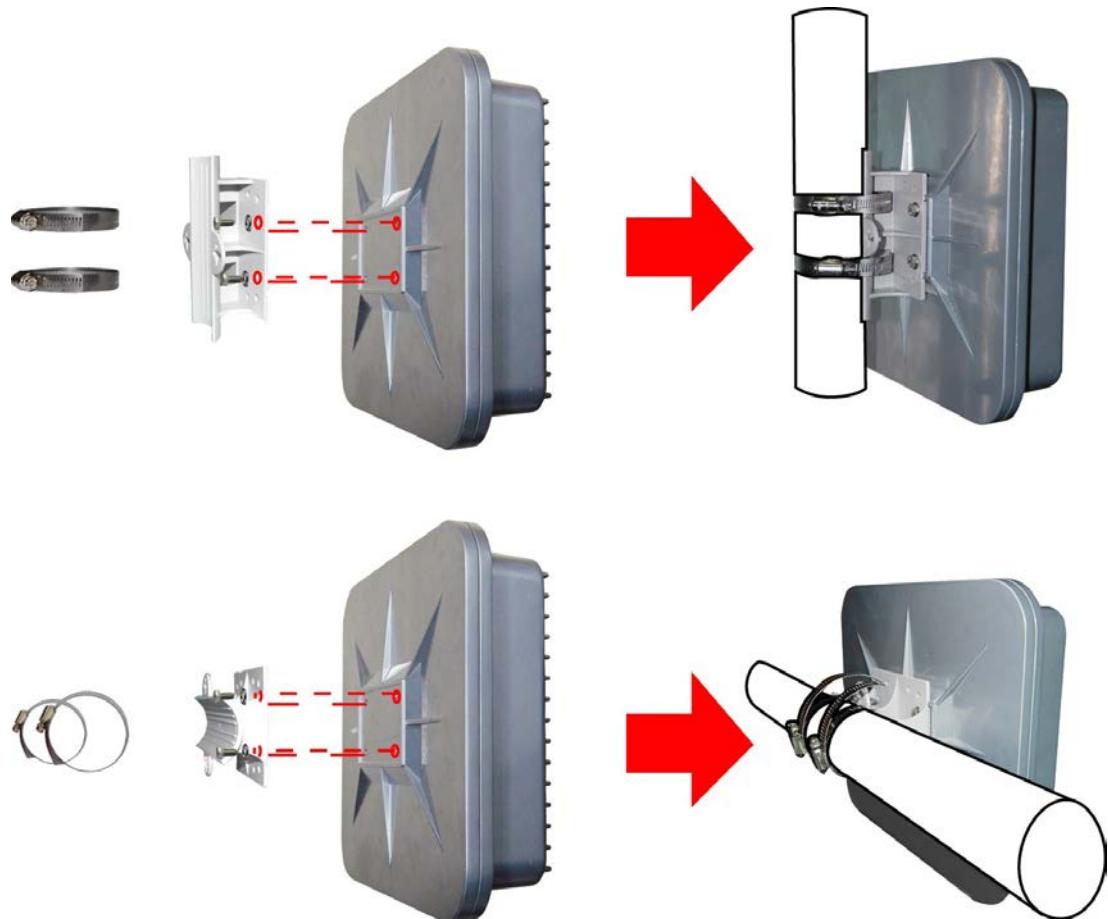
Product CD contains Quick Installation Guide and User Manual!

---

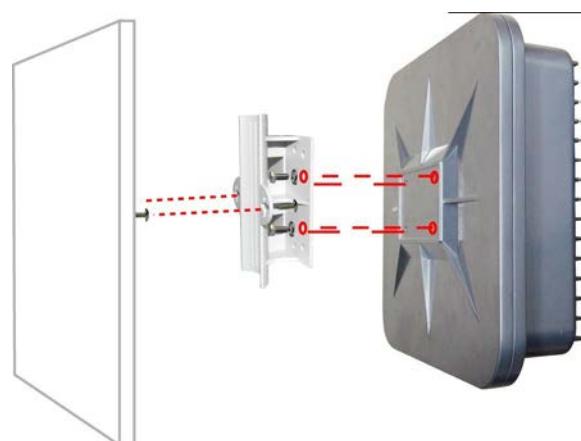
---

## Chapter 3 System Installation

### Pole Mounting



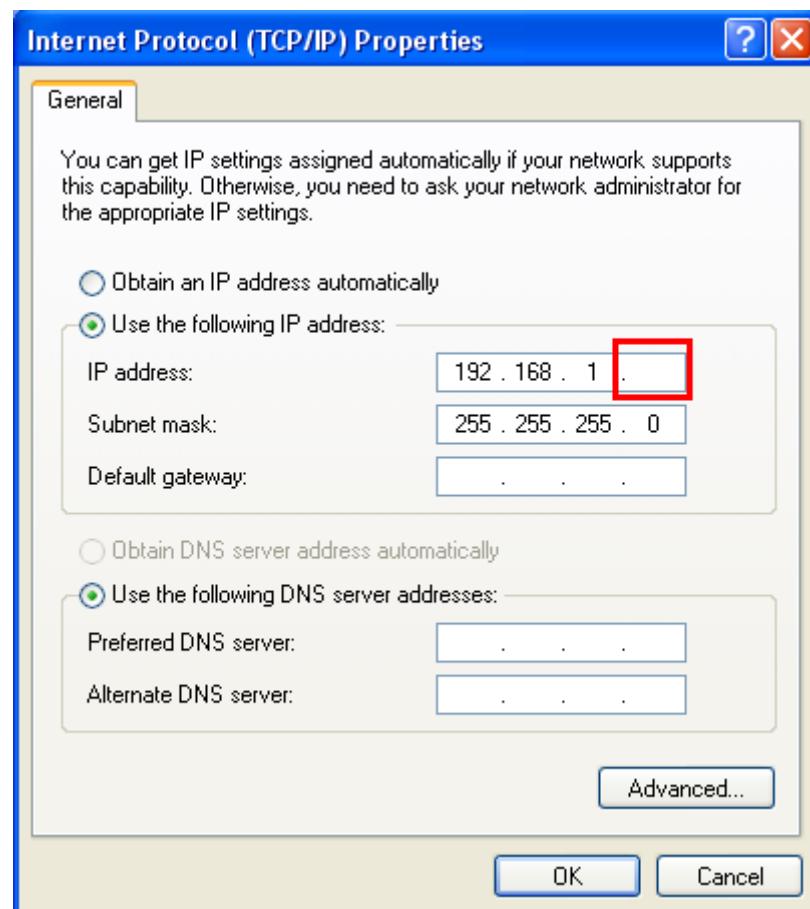
### Wall Mounting



# Chapter 4 Configuration

Connect the IEEE 802.11b/g/n Wireless CPE with your PC by an Ethernet cable plugging in LAN port of PoE injector in one side and in LAN port of PC in the other side. Power on the IEEE 802.11b/g/n Wireless CPE by PoE from PoE injector.

1. Assign a static IP address to your PC which should be in the same network segment with the IEEE 802.11b/g/n Wireless CPE. As the default IP address of the IEEE 802.11b/g/n Wireless CPE is 192.168.1.1, you may choose from 192.168.1.2 to 192.168.1.254. Then click **OK**.



2. Open the web browser on your PC, key in the IP address (192.168.1.1) of the IEEE 802.11b/g/n Wireless CPE in the address bar, and then enter.



- Now, you will see the log-in page of the IEEE 802.11b/g/n Wireless CPE. The default "Name" and "Password" are "**admin**" and "**password**" respectively. Enter them and then click **Login**.

The screenshot shows a web-based login interface for a "Wireless Broadband Access Point". The title bar reads "Wireless Broadband Access Point". The form contains fields for "Name" (with "admin" entered) and "Password" (empty). Below the fields are "Login" and "Reset" buttons.

\* Since the IEEE 802.11b/g/n Wireless CPE covers "AP mode", "Wireless Client mode", "Bridge mode" as well as "AP Repeater mode", the following steps are categorized for convenience reading to describe how to set each mode after successful log-in.

### AP Mode

- Choose **Wireless > Basic Settings**. The default is AP mode already. Here, you can set the parameters to optimize your application, or you can leave them as the default. Click **Apply** to save the parameters.

**Note:**

- In the example here, we only change the "Wireless Network Name (SSID)" as "Join\_me", and later, we will show you if AP mode works correctly. In addition, for better coverage of the AP, you may also use an external antenna; if so, remember to set the antenna setting from "Internal (8 dBi)" to "External (N-Type)" after your external antenna is successfully installed.
- To be reminded that you are able to choose "External (N-Type)" only when you

have well done installing the external antenna; otherwise, it might cause damage IEEE 802.11b/g/n Wireless CPE itself.

The screenshot shows the 'Wireless Basic Settings' page of the access point's web interface. The left sidebar has 'Basic Settings' expanded, with 'Profile Settings' selected. The main area title is 'Wireless Basic Settings'. A sub-instruction says: 'Use this page to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless mode as well as wireless network parameters.' Below are configuration fields:

- Disable Wireless LAN Interface
- Wireless Mode: AP (dropdown) Site Survey
- Wireless Network Name (SSID): Wireless (text input) (more...)
- Broadcast SSID: Enabled (radio button)
- 802.11 Mode: 802.11B/G/N (dropdown)
- HT protect: Enabled (radio button)
- Frequency/Channel: 2452MHz (9) (dropdown)
- Extension Channel: None (dropdown)
- Channel Mode: 20 MHz (dropdown)
- Antenna: Internal (8 dBi) (radio button)
- Maximum Output Power (per channel): 12, 26, 26 dBm (sliders)

2. If security is required, open **Wireless > Profile Setting** and enter “**VAP Profile 1 Settings**” as below. You may set the parameters like “Network Authentication” and “Data Encryption” for more secure network communication in your application. Click **Apply** to save the parameters.

The screenshot shows the 'VAP Profile1 Settings' page. The left sidebar has 'Profile Settings' expanded, with 'Profile Settings' selected. The main area title is 'VAP Profile1 Settings'. It contains two sections:

#### Basic Settings

Profile Name:	Profile1
Wireless Network Name (SSID):	Wireless
Broadcast SSID:	Enabled (radio button)
Wireless Separation:	Enabled (radio button)
WMM Support:	Enabled (radio button)
Sta. Num Limitation:	Enabled (radio button)
Max. Station Num:	32 (0-32)

---

#### Security Settings

Network Authentication:	Open System (dropdown)
Data Encryption:	Open System (dropdown)
Key Type:	Shared Key (radio button)
Default Tx Key:	Legacy 802.1x (radio button)
WEP Passphrase:	WPA with Radius (radio button)
Encryption Key 1:	WPA2 with Radius (radio button)
Encryption Key 2:	WPA & WPA2 with Radius (radio button)
	Create Keys

## Wireless Client Mode

1. Choose **Wireless > Basic Settings**. Then you will see the “Wireless Basic Settings” page. Choose “**Wireless Client**” from Wireless Mode, and click **Apply** to save it. Feel free to change the other parameters to optimize your application before clicking **Apply**.

 **Note:**

- For longer transmission of the CPE, you may also use an external antenna; if so, remember to set the antenna setting from “Internal (8 dBi)” to “External (N-Type)” after your external antenna is successfully installed, otherwise **do not** set to “External (N-Type)” without physically attaching external antenna, otherwise, damage might be caused to the device itself.



The screenshot shows the Wireless Broadband Access Point management interface. The top navigation bar includes links for Status, System, Wireless (which is highlighted in blue), Management, and Tools, along with a Logout button. On the left, a sidebar menu lists Basic Settings, Profile Settings, Advanced Settings, Access Control, and WDS Settings. The main content area is titled "Wireless Basic Settings" and contains the following configuration fields:

- Disable Wireless LAN Interface
- Wireless Mode:
- Wireless Network Name (SSID):
- 802.11 Mode:
- Channel Mode:
- Antenna:  Internal (8 dBi)  External (N-Type)
- Maximum Output Power (per chain): A slider scale from 12 to 26 dBm, currently set at 26 dBm.
- Data Rate:
- Extension Channel Protection:
- Enable MAC Clone:

At the bottom right of the form are "Apply" and "Cancel" buttons.

2. Click the “**Site Survey**” button beside **Wireless Mode**. It will scan all the available access points within coverage. Select the one you prefer to connect to, and click **Selected** to establish the connection.

Select	SSID	Frequency/Channel	MAC Address	Wireless Mode	Signal Strength	Security
<input type="radio"/>	aeap17	2412MHz(1)	00:24:01:df:67:8e	802.11B/G	-78	WPA
<input type="radio"/>	aeap18	2412MHz(1)	00:21:91:f6:f7:55	802.11B/G	-77	NONE
<input type="radio"/>	FRITZ!Box Fon WLAN 7270	2412MHz(1)	00:24:fe:46:b9:c8	802.11B/G/N	-75	WPA2
<input type="radio"/>	RT-G32	2437MHz(6)	20:cf:30:d6:5a:d0	802.11B/G	-62	WEP
<input type="radio"/>	MIS-AP2	2437MHz(6)	00:13:f7:8e:8d:d3	802.11B/G/N	-49	WPA2
<input type="radio"/>	HTC	2437MHz(6)	90:21:55:c2:3f:9c	802.11B/G	-81	NONE
<input type="radio"/>	DIR-635	2462MHz(11)	00:24:a5:b4:cf:77	802.11B/G	-64	WPA
<input type="radio"/>	Apple Network 873e69	2417MHz(2)	10:9a:dd:87:3e:69	802.11B/G/N	-75	WPA2
<input type="radio"/>	ASIX_WiFi	2422MHz(3)	00:1e:58:29:28:27	802.11B/G	-65	NONE

3. If the AP you connect to require authentication or encryption keys, click **Profile Settings** in the left column, fill out the corresponding items, and click “**Apply**” for data encryption.

## Bridge Mode

1. Choose **Wireless > Basic Settings**. Then you will see the “Wireless Basic Settings” page. Choose “Bridge” from Wireless Mode, and click **Apply** to save it. Feel free to change the other parameters to optimize your application before clicking **Apply**.

The screenshot shows the 'Wireless Basic Settings' page. The left sidebar has 'WDS Settings' selected. The main area contains a note about configuring parameters for wireless LAN clients. It includes a checkbox for 'Disable Wireless LAN Interface', dropdown menus for 'Wireless Mode' (Bridge), '802.11 Mode' (802.11B/G/N), 'Frequency/Channel' (2437MHz (6)), 'Extension Channel' (None), 'Channel Mode' (20 MHz), and 'Antenna' (Internal (8 dBi)). There's also a slider for 'Maximum Output Power (per chain)' ranging from 12 to 20 dBm, set to 12, and a dropdown for 'Data Rate' (Auto). The 'Extension Channel Protection' is set to 'None'.

2. Go to “**WDS Settings**” in “**Wireless**”, input the MAC address of the remote bridge to “**Remote AP MAC Address 1**” field and click “**Apply**”.

The screenshot shows the 'WDS Settings' page. The left sidebar has 'WDS Settings' selected. The main area contains a note about the Wireless Distribution System using wireless media to communicate with other APs. It includes fields for 'Local MAC Address' (00:19:70:00:fc:58), 'Remote AP MAC Address1' (00:19:70:00:00:01), and four empty fields for 'Remote AP MAC Address2', 'Remote AP MAC Address3', and 'Remote AP MAC Address4'. At the bottom are 'Apply' and 'Cancel' buttons.

#### **Note:**

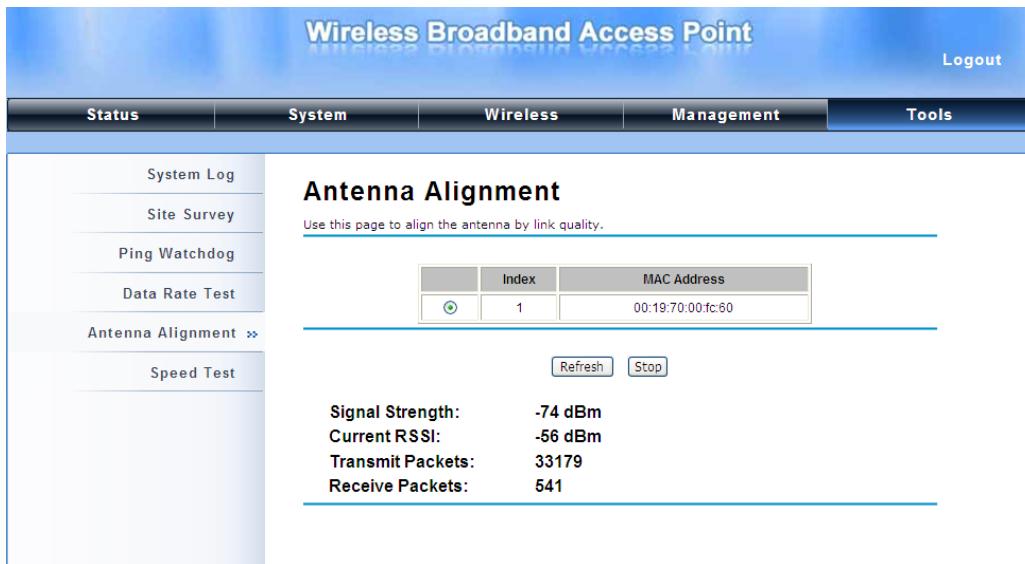
Bridge uses the WDS protocol that is not defined as the standard thus compatibility issues between equipment from different vendors may arise. Moreover, Tree or Star shape network topology should be used in all WDS use-cases (i.e. if AP2 and AP3 are specified as the WDS peers of AP1, AP2 should not be specified as the WDS peer of AP3 and AP3 should not be specified as the WDS peer of AP2 in any

---

case). Mesh and Ring network topologies are not supported by WDS and should be avoided in all the use cases.

---

3. Repeat the above procedures to configure the remote IEEE 802.11b/g/n Wireless Outdoor CPE.
4. Use ping to check whether the link between the two bridges is OK.
5. To get a better wireless connectivity, antenna alignment is strongly recommended after both bridges are installed long distance apart.
6. Open “**Antenna Alignment**” in **Tools**. Choose the remote peer and click on the “**Start**” button.



## AP Repeater Mode

1. Choose **Wireless > Basic Settings**. Choose “**AP Repeater**” from Wireless Mode, and click **Apply** to save it. Feel free to change the other parameters to optimize your application before clicking **Apply**.

 **Note:**

---

- For longer transmission of the IEEE 802.11b/g/n Wireless CPE, you may also use an external antenna; if so, remember to set the antenna setting from “Internal (8 dBi)” to “External (N-Type)” after your external antenna is

---

---

successfully installed, otherwise **do not** set to ““External (N-Type)” without external antenna, in case IEEE 802.11b/g/n Wireless CPE has damage....

---

The screenshot shows the 'Wireless Basic Settings' page of a web-based configuration interface for a Wireless Broadband Access Point. The top navigation bar includes links for Status, System, Wireless (which is selected), Management, and Tools, along with a Logout link. On the left, a sidebar menu lists Basic Settings (selected), Profile Settings, Advanced Settings, Access Control, and WDS Settings. The main content area is titled 'Wireless Basic Settings' and contains a brief description: 'Use this page to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless mode as well as wireless network parameters.' Below this, there is a checkbox labeled 'Disable Wireless LAN Interface'. The configuration fields include:

- Wireless Mode: AP Repeater (selected)
- Wireless Network Name (SSID): Wireless
- Broadcast SSID: Enabled (radio button selected)
- 802.11 Mode: 802.11B/G/N (selected)
- HT protect: Enabled (radio button selected)
- Frequency/Channel: 2437MHz (6) (selected)
- Extension Channel: None
- Channel Mode: 20 MHz (selected)
- Antenna: Internal (8 dBi) (radio button selected)
- Maximum Output Power (per channel): 12 dBm (selected)

2. To establish point-to-point bridge connection, please follow the procedures described in Bridge mode. To connect the wireless client to the AP, please follow the procedures described in Wireless Client mode.

Congratulations! You have primarily completed configuration on the IEEE 802.11b/g/n Wireless Outdoor CPE and they can be put into operation. For more advanced configurations, please refer to the User manual.